

15. (a) What three elements are present in all alcohols?
 (b) What are three uses for alcohols?

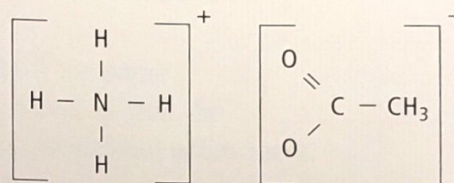
Understanding Key Ideas

16. How many times more basic is a solution of pH 11 compared to a solution of pH 9?
17. What is the colour of the indicator after it is added to each of the following solutions? (Assume the colour of the solution being tested does not mask the colour of the indicator.) Refer to the indicator chart in Figure 5.6 on page 224.
- (a) lemon juice in the presence of indigo carmine indicator
 (b) milk in methyl red indicator
 (c) bleach in phenolphthalein
 (d) tap water in phenolphthalein
 (e) egg white in litmus
18. Change the following names to the names used when the acid is aqueous.
- (a) hydrogen fluoride
 (b) hydrogen perchlorate
 (c) hydrogen sulfate
 (d) hydrogen chloride
19. Complete and balance the following neutralization reactions. Then, write the names of all the reactants and all the products in each chemical reaction.
- (a) $\text{HNO}_3 + \text{Al}(\text{OH})_3 \rightarrow$
 (b) $\text{HF} + \text{KOH} \rightarrow$
 (c) $\text{H}_3\text{PO}_3 + \text{Ca}(\text{OH})_2 \rightarrow$
 (d) $\text{CH}_3\text{COOH} + \text{NaOH} \rightarrow$
 (e) $\text{H}_2\text{SO}_4 + \text{NaOH} \rightarrow$
20. Complete and balance the following chemical reactions between an acid and a metal.
- (a) $\text{HBr} + \text{Mg} \rightarrow$
 (b) $\text{H}_2\text{SO}_3 + \text{Al} \rightarrow$
 (c) $\text{HI} + \text{Ca} \rightarrow$
 (d) $\text{HClO} + \text{Zn} \rightarrow$
 (e) $\text{H}_3\text{PO}_3 + \text{Na} \rightarrow$
21. State whether each of the following is an acid, a base, a salt, or none of these.
- (a) $\text{HCl}(\text{aq})$ (d) MgCl_2
 (b) KOH (e) K_3PO_4
 (c) $\text{Sr}(\text{OH})_2$ (f) $\text{H}_2\text{SO}_4(\text{aq})$

22. Classify each of the following compounds as organic or inorganic by examining their formulas.
- (a) CH_3OH (e) FeBr_3
 (b) $\text{Mg}(\text{HC}_2\text{O}_4)_2$ (f) CH_4
 (c) SiC (g) NH_3
 (d) Na_2CO_3 (h) CO
23. Draw structural diagrams for these organic compounds.
- (a) CH_4 (b) $\text{CH}_3\text{CH}_2\text{CH}_3$

Applying Your Understanding

24. Some compounds, such as ammonium acetate, can fall into more than one category at a time.



Ammonium acetate is made of positive ammonium ions and negative acetate ions, consistent with the formula of a salt. The acetate ion contains carbon atoms, making it organic. The ammonium ion can react with water to release hydrogen ions, so it is an acid. The acetate ion can react with water to make hydroxide ions, so it is a base.

- (a) Do you think it is possible for this salt to make a solution both acidic and basic at the same time?
 (b) How would you test your prediction?

Pause and Reflect

In this chapter, you used your knowledge of chemical formulas to classify compounds. How might you use this knowledge in your daily life? Why might it be important for you to recognize the type of compound by reading its chemical formula?